

REMARKS

Claims 18-22, 24 and 25 are currently pending in this application.

The drawings have been objected to under 37 C.F.R. § 1.83(a) for allegedly failing to show every feature of the invention specified in the claims. Applicants are unable to respond with specificity to this ground of objection, because the Office Action contains no indication of exactly which elements of the claims are believed to be missing in the drawings. Rather, the Office Action refers generally to the claimed language of Claims 18-22, 24 and 25, which are all of the claims currently of record in the application. However, to the extent that this ground of objection is understood, Applicants respectfully submit that all elements contained in the claims are in fact shown in the drawings.

While Applicants are, as noted, unable to respond more specifically, the following is noted in order to advance the prosecution of this application. Referring to Claim 18, the case member, recited in line 2 is designated by reference numeral 3, while the air duct in line 2 is designated by reference numeral 14. The substrate 2 in line 4 is reference numeral 7; electronic elements are resistors 23, for example; conductor wire films are designated by reference numeral 8; insulating overcoat film in line 7 are designed by 26. Finally, the opening referred to at line 10 is designated by reference numeral 22, while the solder at line 15 is shown at item 27. If the Examiner remains of the belief that

some of the elements recited in the claims are not shown in the drawing, clarification is respectfully requested, including an indication of which elements are believed to be missing.

Claims 18 through 22, 24 and 25 (all claims of record) have been rejected under 35 U.S.C. §112, second paragraph for allegedly failing to particularly point out and distinctly claim the invention, based on certain formal issues cited at page 3 of the Office Action. In response to these grounds of rejection, Applicants have amended Claim 24 at line 8 to change the words “conductor wire” to “conductor wire films”, for which there is an antecedent basis in the claim. Similarly, Claim 25 has been amended in the same manner at line 9. In response to the Examiner’s inquiry at page 3 regarding where and how the “conductor wire films” are shown in the drawing, Applicants note that these elements of the claim are indicated by the reference numeral 8 in Figures 5 and 6. (See paragraphs [0002], [0032] and [0046].)

With regard to the Examiner’s inquiry concerning the use of the phrase “thick film technology” in Claims 18 and 19, Applicants have revised the language of both claims to recite that the electronic elements and the insulating overcoat “comprise thick film elements formed on said substrate”. The terms “thick film” and “thick film technology” are well known and universally understood among those who are skilled in the art, to designate a particular kind

of film. For example, attached hereto is a copy of a “thick film fact sheet” which is published on the Internet at www.micropen.com/PDFs/literaturedocuments/thickfilmfacts.pdf. As noted therein, thick film technology has been used as an electronic circuit process since 1942. It also notes that thick film technology is currently used in a wide assortment of products, ranging from precision/stable resistors to complex dense electronic assemblies, and from high power heating applications to non-electrical seal and adhesive applications. Basic facts concerning conventional thick film technology are set forth in that webpage.

This structure is, as noted previously, illustrated in the drawings and designated by the reference numeral 8. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

Toward the bottom of page 3 of the Office Action, the following question is posed, “For example, the elected species was Figure 6 in which a resistor, not a conductor, is claimed. Where is this structure shown in the drawings?” In response to this inquiry, Applicants note that Figure 6, which illustrates the elected species, is a detailed view of a component of the overall electronic circuit, illustrated, for example in Figures 1, 2, 5, 6 and 15 through 18. Thus, for example, each of the elements 8, 21 and 23 in Figure 6 also appears in Figure 5 and in Figure 1. Accordingly, Figure 6 is merely illustrates the details by which the elected species differs from the other species. In particular, in Figure 6, the

probing portions 21 are shown as having a round shape. Three other, non-elected, species are illustrated in Figure 7, 8 and 9, in which the probing portions 21 are elliptical, rounded squares and squares with chamfered corners, respectively. (See paragraph [0053].) None of the claims of the present application is specific to any of the species in Figures 7 through 9.

Accordingly, while Figure 6 illustrates the shape of the probing portions 21, which have been elected, the overall invention is directed to “an electronic device”, which includes conductor wire films 8, the probing portions 21 and, for example, a resistor 23. In all events, however, the invention is clearly not limited to a resistor, because, as noted previously, the illustrated species in Figure 6 is merely a part of an overall circuit, which is embodied in the claimed invention. None of the claims is limited to a resistor.

Claims 18 through 22, 24, and 25 have been rejected under 35 U.S.C. § 102(b) as anticipated by Dedert et al (U.S. Patent No. 6,142,018). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims which remain of record in this application distinguish over Dedert et al, whether considered by itself or in combination with other references.

The Dedert et al reference discloses a variable resistor which is provided in the form of a cermet film fired on a refractory substrate. The cermet film is burnished to reduce asperity of the fired film. While Dedert et al is therefore

representative of a methodology for applying a particular type of resistive film on a substrate, it neither teaches nor suggests the elements of the invention recited in Claims 18-22, 24 and 25.

In particular, the Office Action states that Dedert et al, in Figures 1 to 6 and specifically Figures 1 and 2, shows an electronic device contained in a case member which is disposed in an air cleaner or an air duct of an automobile. Insofar as Applicants have been able to determine, however, Dedert et al contains no disclosure which teaches or suggests an electronic device disposed in an air cleaner or air duct. Thus, at Column 1, lines 5-9, the disclosure states that the invention pertains generally to "measuring and testing, and more particularly to measuring liquid levels using a float and sensor". It further specifies that the measuring apparatus is preferably used to detect fuel levels within a receptacle such as a fuel tank. Moreover, the disclosure at Column 4, line 57 through Column 5, line 7, which is referred to in the Office Action does not appear to be related to an air cleaner or air duct in which the electronic device according to the present invention is disposed.

The Office Action also indicates that, in Dedert et al, an electronic device comprises a substrate 110, having electronic elements mounted thereof and conductor wire films 120, 122 and 124 made of silver or silver alloys. However, as indicated succinctly in the Abstract, the Dedert et al structure is created by

providing a “cermet” film fired on a refractory substrate. (See also, Column 3, lines 26-33.) According to Webster’s Ninth New Collegiate Dictionary, the word “cermet” is derived from a combination of the words “ceramic” and “metal”, and refers to a strong alloy of heat resistant compound (such as titanium carbide), and a metal such as nickel, used especially for turbine blades. Nowhere in Dedert et al have Applicants been able to find any disclosure which suggests that the cermet films 120, 122, 124 (Column 2, lines 48-49) contain any silver at all. Accordingly, Applicants respectfully submit that Dedert et al does not disclose a device which includes conductor wire films made of silver or silver alloys.

The Office Action further states that Dedert et al discloses an insulating overcoat 130, 132, 134 made of a material selected from the group consisting of glass and resin covering the surface of the device. However, the only discussion of the latter reference numerals appears at Column 2, lines 42-49, with reference to Figures 1 and 2 (prior art). At Column 2, lines 45-46, the disclosure states that the cermet conductors 120, 122, 124 “include microscopically rough surfaces 130, 132, 134. Surfaces 130, 132, 134 may be formed of the same cermet material as base conductors 120, 122, 124, or, as is known in the prior art, the surfaces 130, 132, 134 may be a different composition.” It is noted in this regard that cermet is a conductive material, and not an insulating material. Moreover, nothing in the disclosure in Dedert et al teaches or suggests that the surface structure referred to as made of glass or resin.

The Office Action further indicates that the “overcoat” (which as noted previously is made of cermet, and not glass or resin) has openings through which surfaces of the conductor wires are exposed, with the openings being formed in the shape having no square corners and no acute corners. However, Applicants have been able to find no discussion of this feature contained anywhere in the disclosure. The drawings do not show the shape of any alleged openings (corresponding to those recited in the claims) nor does the specification indicate any, or state what their shape might be if they did exist.

The Office Action further states that the entire exposed surface of the conductor wire films are covered with a solder, so that the wire films are protected from any corrosive gas. However, Applicants were also unable to find any disclosure of this feature of the invention in Dedert et al. The gaps 112 and 114 between the cermet conductors 120, 122 and 124, as depicted in Figure 1 (prior art) in Dedert et al expose the surface of the substrate, not the surfaces of the wire films. Indeed, the exposed surface (of the substrate 110) is not covered with solder at all.

At item 19, the Office Action states that Dedert et al discloses a substrate 110 having conductor wires 120, 122, 124 made of silver or alloys and electronic elements mounted thereon. However, as noted previously, nothing contained in

Dedert et al teaches or suggests that the cermet material used for this purpose contains silver or a silver alloy.

Item 20 of the Office Action indicates that Dedert et al shows a device in which openings have a shape that is selected from the group consisting of round, elliptical, rectangular with round corners and rectangular with chamfered corners. However, as noted previously, neither the drawings nor the text of the specification in Dedert et al indicates the shape of any openings which might be created. In particular, there is no top view which would show such shape. To the extent that the Office Action refers to the cross-sectional shape of the gaps 112 and 114, as shown in Figure 1, for example, Applicants note that the corners are clearly "square".

The reference to Masuda in item 22 of the Office Action is not understood, because the only ground of rejection indicated in the Office Action is a §102(b) rejection over Dedert et al.

The Office Action also states that the entire exposed surface of the conductor wire films in Dedert et al are covered with a solder whose main component is tin. However, insofar as Applicants have been able to determine, Dedert et al does not disclose the use of a solder whose main component is tin. It is noted in this regard that tin solder is poorer in wettability than lead solder (whose main component is lead); the shape of the openings which are to be

covered with the tin solder should be one that has no square corners or acute angles as discussed at page 14, lines 14 through 20. Moreover, the side faces of the cermet conductors in Figure 1 of Dedert et al are exposed surfaces which are not covered with solder. In addition, the soldering in Dedert et al is provided for electrical connection between the cermet conductor having the conductive rough surfaces and unknown elements. Dedert et al does not address the protection of the conductive wire films from corrosive gas.

At item 25, the Office Action states that in Dedert et al, Figures 1 and 2 specifically show an electronic device for a case member disposed in an air duct of an automobile, comprising a substrate 110 and having resistor film mounted thereon. It also states that the resistor has conductor wire films, 120, 122, 124 and terminals 8, 7 connected thereto. Applicants were unable to find any such terminals 8, 7 shown in Dedert et al. No such reference numerals appear in the drawing or in the specification.

In summary, the Dedert et al reference is unrelated to air cleaners or gas flow ducts. This reference states that the rough surfaces 130, 132, 134 of the cermet conductor films 120, 122, 124 are burnished with a drum 400. After burnishing, the surfaces are cleaned with a stream of compressed air. (See Column 4, line 58 through Column 5, line 7.) However, as can be seen from the

foregoing discussion, Dedert et al appears otherwise unrelated to the subject matter of the present invention as defined in the claims currently of record.

In light of the foregoing remarks, this application should be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #056208.52613US).

Respectfully submitted,



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